

POLYCHAETOUS ANNELIDS*

FROM THE ARCTURUS OCEANOGRAPHIC EXPEDITION.

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(Figs. 177-179 incl.)

The polychaetous annelids collected by the Arcturus Expedition were by the courtesy of Director Beebe, submitted to me for examination and the following is my report. One new genus and sixteen new species are represented in the collection. A tabulated list of the families follows:

Family	Old species	New genus	New species
Amphinomidae	6	—	—
Aphroditidae	1	—	—
Polynoidae	2	—	5
Alciopidae	2	—	1
Tomopteridae	—	—	2
Syllidae	5	—	—
Nephtydididae	1	—	—
Chrysopetalidae	1	—	—
Phyllodocidae	4	—	1
Nereidae	2	—	2
Hesionidae	1	—	—
Glyceridae	2	—	—
Leodiciidae	16	—	1
Ariciidae	1	—	—
Spionidae	—	—	1
Flabelligeridae	—	—	2
Maldanidae	fragments		
Sabellariidae	1	—	—
Opheliidae	—	1	1
Terebellidae	2	—	—
Sabellidae	1	—	—
Serpulidae	1	—	—

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Family AMPHINOMIDAE Kinberg.

Eurythoe complanata Pallas.

Aphrodita complanata (Pallas) 1776, p. 109, pl. 8, fig. 1926.
Eurythoe pacifica Kinberg, 1857, p. 14.

Collected at 17° 39' N., 63° 16' W., in 100 fathoms on Saba Bank; nine specimens; 0° 19' N., 89° 57' W., at Tower Island, Galapagos, one specimen; 0° 16' S., 91° 23' W., one specimen; 1° 22' S., 89° 39' W., at Hood Island, four specimens.

Hermodice carunculata Kinberg.

Hermodice carunculata Kinberg, 1857, p. 13.

Only three specimens, two of them very small, occur in the collection. The large one and one of the small ones, were taken at 17° 39' N., 63° 16' W.; while the other small one is recorded as taken one minute farther west. It seems possible that this distinction in locality may be an error. Kinberg's description of this species is very meagre, better ones occurring in McIntosh, (1885, pp. 24 to 27, pl. 5, p. 3A, figs. 1 to 4, and in Ehlers (1887), pp. 27 to 29). It seems probable that dorsal transverse intersegmental dark lines occur in the young, but disappear as the animal grows older.

Amphinome Brugiere.*Amphinome pallasi* Quatrefages.

Amphinome pallasi Quatrefages 1865, T. I, pp. 394, 395.

Collected at 2° 26' N., 85° 32' W., fourteen specimens.

Chloeia Savigny.*Chloeia euglochis* Ehlers.

Chloeia euglochis Ehlers, 1887, pp. 18 to 24, pl. 1, figs. 1 and 2; pl. 2, figs. 1 to 8, pl. 3, figs. 1 to 4.

Collected at 5° 32' N., 86° 59' W., at Cocos Island, two specimens.

Notopygos Grube.*Notopygos crinita* Grube.

Notopygos crinita Grube, 1855, p. 93.

Ehlers 1887, pp. 24 to 26, pl. 1, fig. 3, pl. 3, figs. 5, 6, 7.

Collected at 5° 32' N., 86° 59' W., Cocos Island, one specimen; 17° 39' N., 63° 17' W., in 100 fathoms, two small specimens. These have only fourteen somites and are unusually small but apparently are immature specimens of this species.

Hipponoe Aud. et M. Ed.*Hipponoe gaudichaudi* Aud. et M. Ed.

Hipponoe gaudichaudi, Audouin et Milne Edwards, 1834, pp. 128 and 129,
 pl. 2B, figs. 10, 10bis.

McIntosh, 1885, p. 30 to 33, pl. 1, fig. 5, pl. 4, fig. 3,
 pl. 3A, figs. 13 to 17.

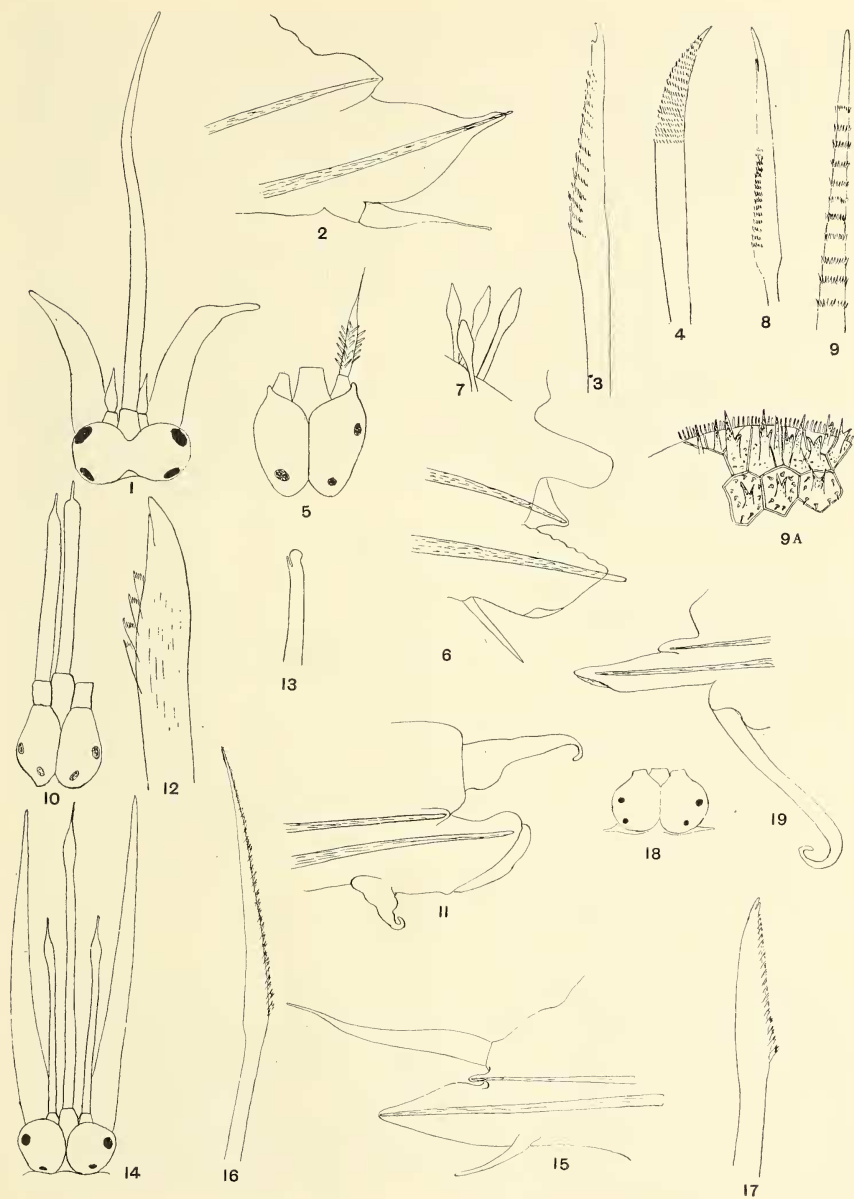


Fig. 177. 1, *Harmothoe sylliformia*, anterior end $\times 25.5$; 2, parapodium $\times 45$; 3, neuropodial seta $\times 185$; 4, notopodial seta $\times 215$; 5, *Harmothoe lanceolata*, anterior end $\times 30$; 6, parapodium $\times 85$; 7, detail of cilia on cirrus $\times 85$; 8, neuropodial seta $\times 250$; 9, notopodial seta $\times 250$; 9a, detail of elytron $\times 27.5$; 10, *Lepidasthenia picta*, anterior end $\times 10$; 11, posterior parapodium $\times 15$; 12, seta $\times 185$; 13, seta from first parapodium $\times 250$; 14, *Lepidasthenia rufa*, anterior end $\times 25$; 15, parapodium $\times 45$; 16, dorsal seta of neuropodium $\times 250$; 17, ventral seta of neuropodium $\times 250$; 18, *Lepidasthenia variegata*, anterior end $\times 12.5$; 19, first parapodium $\times 27.5$.

One specimen very poorly preserved agreeing with McIntosh's description except that the simple setae are smoother than he figured. I was also unable to find the bifid setae which he said sometimes occur. The hooks on the neuropodia are invaginated leaving small pits. Augener (Zool. Anzeiger Bd. 36, p. 247, 1910) showed that the "parasites" recorded by earlier writers on the ventral surface of this species are really the young. Augener also questions the accuracy of the belief that this species normally lives in the valves of the barnacle. Collected at 2589.

Family APHRODITIDAE.

Pontogenia Claperede.

Pontogenia sericoma Ehlers.

Pontogenia sericoma Ehlers, 1887, p. 46, pl. 7, figs. 1 to 5.

Collected at 17° 39' N., 63° 17' W., in 100 meters on Saba Bank, one specimen. Pedunculate eyes are commonly given as a character of this genus but Ehlers (loc. cit. p. 46), states that the eyes are sometimes on "Polstern" as in the species here described. The single specimen in this collection has lost its median tentacle and its anal cirri.

Family POLYNOIDAE.

Laetmonice Kinberg.

Laetmonice kinbergii Baird.

Laetmonice kinbergii Baird, 1865, p. 180.

Collected at 30° 0' N., 74° 02' W., one specimen; 4° 50' N., 87° 0' W., one specimen.

Hermenia Grube.

Hermenia verruculosa Grube.

Hermenia verruculosa Grube, 1856, pp. 44, 45.

Treadwell, 1911, pp. 9 to 11, figs. 23 to 26.

Collected at 17° 39' N., 63° 17' W., in 100 metres.

Harmothoe Kinberg.

Harmothoe sylliformia, sp. nov.

(Fig 177: figs. 1 to 4.)

Large specimens are 9 mm. long and 1.25 mm. wide. In size and general appearance they resemble short, thick bodied syllids, this resemblance being heightened by the dark red color of the pharynx visible to the naked eye; this being a common occurrence among the syllids. While I am unable to fit them into any established genus I am listing them as *Harmothoe* in the belief that they are immature individuals. They have large anterior eyes and thirteen instead of fifteen pairs of elytra in both of which characters they differ from the diagnosis of *Harmothoe*. Also, the elytra have only traces of roughnesses on their surfaces.

The prostomium (figure 1) is 0.75 mm. broad and about half of that in length, and is covered by the first pair of elytra. It is transversely oval in

outline, and is divided dorsally by a median longitudinal division into two lobes, the lateral margin of each lobe being, except for a small anterior portion, nearly semicircular in outline. Both pairs of eyes are large and supplied with lenses. The anterior pair face antero-laterally and are a trifle larger than the posterior pair which face latero-posteriorly. The cirrophore of the median tentacle occupies the middle of the anterior margin. It is relatively rather heavy and its style is very long, as much as seven times the length of the prostomium. The preservation of these cirri was not very good, but it apparently terminates in a blunt point. With high magnification it is possible to see on its surface a few sparsely distributed club-shaped cilia. The paired tentacles lie latero-ventrally to the median on short cirrophores. The styles are elongated flask-shaped, the whole cirrus being hardly longer than the prostomium. A few cilia may be seen on the surface. The dorsal tentacular cirrus is about the size of the median tentacle, the ventral one about one half as long as this. The palps are about four times as long as the prostomium, taper from the base but at about the beginning of the terminal fourth enlarge slightly and terminate in an acute tip. There is a trace of pigment at the enlarged region. The dorsal cirri of anterior somites are shorter than the median tentacle but resemble it in form. They are similar in form throughout the body but become slightly shorter posteriorly. I was unable to find any anal cirri.

The first somite has no neuropodium, its notopodium being represented by a pair of stout brown setae. The second somite has a complete parapodium, the notopodial setae being about 25 in number, arranged in a dorso-laterally directed whorl. The neuropodial setae are more slender than the notopodial but are longer than they and make up a tuft extending fully twice the length of the parapodium beyond its apex. The parapodium (figure 2) has conical neuropodial and notopodial lobes the latter much the smaller of the two, and without the slender terminal lobe found in the former. Each has one acicula and in each the setal gland is conspicuous.

The neuropodial setae (figure 3) have long shafts followed by a broader portion carrying transverse rows of teeth. This portion narrows and ends in a terminal tooth, with a much smaller subterminal tooth lying just proximal to this. The notopodial setae are much shorter and thicker than the neuropodial. They curve very slightly to the pointed apex and carry numerous transverse rows of toothed plates (figure 4). The cirrophore of the ventral cirrus is carried well toward the apex of the parapodium. Its style is shaped like that of the paired tentacle and extends beyond the end of the parapodium.

The elytra are very thin and transparent so that under a lens it is sometimes difficult to see if they are present. Beyond the statement that they have smooth margins and are approximately circular in outline not much of importance can be said about them.

The protruded pharynx is, because of its pigmentation, in marked contrast to the remainder of the body. It is a club shaped mass on which I could find no trace of terminal papillae or teeth.

The type was collected at $0^{\circ} 17' S.$, $91^{\circ} 34' W.$, in 300 to 500 fathoms and is in the collections of the New York Zoological Society. Others were collected at the following localities; $2^{\circ} 0' S.$, $89^{\circ} 30' W.$, in 700 fathoms; 11 specimens

and in 400 fathoms, one specimen; 0° 0' S., 91° 53' W.; 4° 50' N.; 87° W., in 500 fathoms; 0° 42' S., 91° 47' W., large number, no depth given; 0° 5' S., 91° 11' W., a few in 250 fathoms; 0° 17' S., 91° 34' W., large number, no depth given; 0° 20' N., 90° 10' W., two in 200 fathoms; 1° 51' S., 89° 50' W., in 1463 meters.

Harmothoe lanceocirrata, sp. nov.

(Fig. 177: *figs.* 5 to 9A.)

The type specimen contains 25 somites but is incomplete posteriorly so that the anal cirri are lacking. Whether any posterior somites are also lacking is difficult to determine but from the way the body narrows in this region it seems probable that they are not. Twelve pairs of elytra completely cover the whole body. At its widest point, not counting the parapodia, the body is a trifle over 2 mm. in diameter and is 15 mm. long. The prostomial width is about 0.5 mm.

The prostomium (figure 5) is a little narrower posteriorly than anteriorly; the posterior angles are rounded and there is a slight lateral bulge. The anterior margins are formed by the acute peaks. The posterior eyes lie near the posterior margin of the prostomium, near the outer angle but on the dorsal surface. In the type the left posterior eye appears double and there is no left anterior one. This is obviously an abnormality. The right anterior eye is on the margin at the point of greatest prostomial width. The median tentacle is lost, but its cirrophore occupies rather more than one third the anterior margin of the prostomium and is nearly one third as long as the prostomium. Its proximal two thirds is faintly marked with brown. The cirrophore of the paired tentacle is about one half as long and wide as that of the median one and is situated below and a little to the median line of the nipple-shaped peak. Its basal half is reddish brown in color. Only the right paired tentacle is present. This is about three times as long as the cirrophore, is faintly tinted with brown and except at the end, is densely "ciliated." It terminates in a delicate colorless process. All tentacular cirri had been lost in the type.

The left palp at its base, is somewhat thicker than the cirrophore of the median tentacle and it is about six times as long as the prostomium, tapering gradually to a very acute apex. The surface is thickly covered with minute cilia, much shorter than the ones on the lateral tentacle. The right palp is much shorter and lighter colored than the left and is evidently regenerating. The cirrophores of the tentacular cirri are more slender than that of the median tentacle and are about as long as it.

The parapodia have a long neuropodium, (figure 6) obliquely truncated at the apex. Its dorsal margin slopes inward and dorsally in the fashion characteristic of this family, to the notopodium. Each parapodial lobe has a single acicula. Setae arise toward the anterior faces of the lobes and the dorsal cirrus is carried on a heavy cirrophore near the top of the posterior surface of the notopodium. The dorsal cirrus has a stout main axis, is longer than the parapodium and tapers gradually to near the end where it narrows very decidedly to a slender portion which is of uniform width until at the apex where there is a small knob. At the base the cirrus is smooth but cilia appear distally; at first

few in number but farther out they increase in number and size until at rather less than half the length of the cirrus they equal in length the transverse diameter of the cirrus. They are, throughout the greater part of the cirrus, very closely crowded together so that accurate drawings are impossible. A detail is shown in figure 7. The figure shows the structure of the cilia taken from beyond the middle of the cirrus. Proximally they are more typically cylindrical in form and this form returns at the apex but through the middle region the long lanceolate form is very prominent. Under a hand lens the cirrus because of these cilia, has a feathery appearance. The ventral cirrus is slender and tapering, ending in a rounded tip just beyond the apex of the neuropodium.

The neuropodial setae are longer than the notopodial but more slender. They vary somewhat in length but the longest extend from the body to a distance as great as the length of the notopodial lobe. The basal portion is smooth. Toward the apex each widens into an unsymmetrical lanceolate form and this region from its base to a little beyond its middle, carries transverse rows of toothed plates. The end is smooth, with a terminal and a subterminal tooth. The latter is much the smaller of the two (figure 8). The notopodial setae vary greatly in length, some being nearly as long as the neuropodial. The longest are at the ventral end of the tuft and dorsally they decrease in length, those at the dorsal margin being free for less than half their length. They all have stout central axes, carrying transversely arranged toothed plates for the greater part of their free portions (figure 9).

The elytra overlap in the mid-dorsal line, completely covering the dorsal surface and the head. The most anterior ones are kidney shaped, later ones through the filling up of the "hilus" in the kidney, becoming more nearly oval in outline. This filling material is in contrast with the remainder of the elytron in that it is smooth and delicate, the remainder of the elytron surface being studded with sharp spines. Figure 9A gives a detail of this surface from an elytron near the middle of the body. The portion of each elytron overlapped by the preceding one is smooth. Passing from this toward the exposed surface there first appear minute polygonal areas each bearing in its centre a short stout spine. Passing posteriorly over the free surface these areas become larger, are four or five sided, with heavy boundary lines and the spines become very prominent. The largest spines lie near the posterior margin of the elytron each occupying the centre of a polygonal area while smaller spines lie in a single row around it. The number of these smaller spines varies with the size of the area, twelve being the largest number that I saw. The free margin of the elytron carries a row of "cilia" those on the lateral margin being the largest and most densely clustered. In this preserved specimen the body is flesh-colored, the dense portions of the elytra being of a slightly deeper tint.

The type was collected at 17° 39' N., 63° 17' W., and is in the collections of the New York Zoological Society. A second specimen from the same locality has lost all elytra and all but one dorsal cirrus and is incomplete posteriorly. The median tentacle is also lost. The tentacular cirri are unequal in size, the dorsal one being rather more than half as long as the palp. Both cirri have prominent cilia like those found on the tentacles. They do not have the lanceolate cilia found in the dorsal cirri. Both anterior eyes are present.

Lepidasthenia Malmgren.*Lepidasthenia picta*, sp. nov.

(Fig. 177: figs. 10 to 13.)

The type and one much smaller specimen from which all elytra had been lost. The body of the type is 55 mm. long and 4 mm. wide at the eighth somite. From this point it tapers to an anal width of 0.5 mm. and a prostomial width of 1 mm. The most noticeable feature of the animal is the body-color. The prostomium is colorless except for the eyes and a faint dusting of pigment on the ceratophores of the tentacles. Somite 1 has (in preserved material), a brownish patch on the dorso-median line and one on either postero-lateral margin extending slightly on to the bases of the tentacular cirri. Somites 2 and 3 have each a dorsal median patch with more or less pigment laterally and on the parapodial bases. In somites 4 and 5 the dorsal median area is uncolored and there is a dense mass of pigment on either side of this. The lateral region is not pigmented but the bases of the cirrophores are. Somites 6 and 8 are mostly not colored while 7 has its dorsal surface completely pigmented, with some of this pigment extending slightly over 6 and 8. The lateral region of 7 is not colored but there are traces of pigment on the bases of the parapodia. Behind somite 8 the dorsal coloration is not entirely uniform but in general it has the form of a median band extending laterally as far as the parapodial bases interrupted by occasional colorless patches. The most uniform of these patches are rectangular occurring every 3 or 4 somites. This coloration is continued to the extreme posterior end, being lighter posteriorly. Anteriorly the ventral surface is unpigmented except for a very little around the mouth. At about somite 24 pigment appears. This intensifies farther back so that the latter half of the body is densely pigmented on either side extending on to the ventral cirri, while the mid-ventral region is uncolored.

The prostomium (figure 10) is rather narrower at the posterior than at the anterior border, each of its halves being rather longer than wide. The posterior eyes are on the dorsal surface at some distance from the margin while the anterior ones are lateral in position. The eyes are all of about the same size. The ceratophores of the lateral tentacles are relatively rather heavy, nearly as large as the median, which is partly covered laterally by their margins. The median extends a trifle beyond the lateral ones. The median tentacle is about four times as long as the prostomium and is nearly uniform in width to near the apex when it narrows abruptly into a filiform tip. The lateral tentacles are similar to the median in form but are a very little more slender and not quite so long. The palps have heavy bases but are broken in the specimen, only a portion less than half as long as the tentacle remaining. The dorsal cirri have been lost from most of the anterior somites. The posterior ones (figure 11) are about as long as the setal lobe, and have swollen bases and acute ends. A finger shaped cirrus at the posterior end is apparently one anal cirrus but this end is not well preserved and it may be a distorted dorsal cirrus bent backward as a result of injury. There originally were more than 30 pairs of elytra, but they are all lost in the specimen.

The parapodia (figure 11 from posterior part of body), have post- and presetal lobes of which the former is a trifle the longer and a single row of setae between them. The notopodium is rudimentary and has no setae but contains a single acicula. A single larger acicula lies in the neuropodium. The dorsal cirrus has a swollen base and its acute apex extends beyond the setal lobe. The ventral cirrus is rather stout, lies well out on the parapodium and its apex does not reach the end of the setal lobe. The posterior parapodia are longer with reference to the general body width than are the anterior ones, but in other respects they do not differ.

Most setae have rather heavy shafts which widen slightly toward the ends and carry apical and subapical teeth the former much the larger (figure 12). This terminal wider portion is longer in anterior than in posterior somites and carries a few rows of toothed plates. Most of the anterior setae are broken, but they evidently in life protruded from the body wall much less than did the posterior ones. In the first parapodium are no toothed setae but only a few simpler ones (figure 13), having the apex rounded beyond a slight constriction and carrying a subapical tooth. Owing to lack of material I did not attempt to determine the distribution of these setae. The type is in the collection of the New York Zoological Society. Both specimens were collected at 1° 22' S., 89° 39' W., in 15 feet.

Lepidasthenia rufa, sp. nov.

(Fig. 177: *figs.* 14 to 17.)

One specimen approximately 25 mm. long and 1.5 mm. wide.

In the preserved material a noticeable feature is the series of rusty brown blotches covering anteriorly nearly the whole dorsal surface but posteriorly leaving considerable areas uncolored especially along the mid-dorsal line. This effect is produced by the coloration of the elytra which are primarily thin and transparent so that the body wall shows through them. In the middle of the body each elytron has a rusty-brown patch covering its anterior third, with a continuation of this color in a band extending posteriorly through the centre of the elytron, leaving the inner and outer portions uncolored. Since the body wall is visible through the uncolored part of the elytron the effect is that of a colorless body with a series of rusty brown spots on either side. Anteriorly these blotches cover more of the surface except for the first pair of elytra which are transparent and extend beyond the prostomium to a distance equal to one third the length of the palps. Figure 14 of the head region was drawn without removing the first elytron. The elytra are more or less curled in the preserved material but apparently originally covered the entire dorsal surface. There are approximately sixty somites and twenty two pairs of elytra of which the first extend beyond the head as already stated and the last completely cover the anal cirri. On the dorsal surface are two small pigment patches, one at the base of each parapodium and one on the cirrophore of the dorsal cirrus. On the ventral surface is a patch on the base of each parapodium.

The prostomium is approximately 0.5 mm. in width and 0.25 mm. long, in outline a nearly symmetrical oval (figure 14). There are two pairs of eyes, one, the larger pair, near the widest part of the prostomium, the other near its

posterior border. There is a wide but rather shallow depression on the posterior margin and a narrow median groove extends forward from this to the base of the median cirrophore. The latter is inserted in a shallow depression at the anterior margin of the prostomium and is not more than one fourth as long as the prostomium. The style of the median tentacle is eight times as long as the prostomium. It tapers very slightly from its base to near the end where there is a subterminal swelling and final filamentous tip. The lateral tentacles resemble the median in form but in length and breadth are about two thirds as large. At their bases the palps are fully one half as wide as the prostomium and taper gradually to the apices which are at about the level of the end of the median tentacle. The surface of the palps is perfectly smooth.

The tentacular cirri are shaped like the tentacles, the dorsal ones about equal in size to the median; the ventral ones to the lateral tentacle. The first three dorsal cirri are prominent, resembling the tentacular cirri in form, but are broader basally and the terminal enlargement is smaller. Behind the fourth one they are smaller and in the middle of the body lack the terminal enlargement. The ventral cirri are throughout small and inconspicuous. The anal cirri resemble the posterior dorsal ones in form.

The parapodia (figure 15) are essentially similar in form throughout the body, the first few being smaller than the others. The neuropodium has conical post- and presetal lobes, the latter being the longer. The notopodium is rudimentary and carries no setae. A single acicula extends into it.

There are two kinds of neuropodial setae (figures 16, 17). Both have long shafts smooth nearly to the ends. Near the ends they enlarge and this enlarged portion carries rows of toothed plates along its convex surface. The dorsalmost of the setae are the more slender and the terminal portion longer than in the ventral ones. In both kinds the apices are bifid.

The protruded pharynx is in length about equal to the first ten somites. Its surface is smooth. Dorsal and ventral conical papillae occur on the margin of its aperture which carries also two teeth above and below.

The elytra are irregularly oval in outline throughout and their unpigmented portions are very transparent. The pigment occurs in distinct angular masses closely packed together, its distribution over the surface being as above indicated. There is no trace of either marginal cilia or of spines.

The type and only specimen was collected at 17° 39' N., 63° 17' W., and is in the collections of the New York Zoological Society.

Lepidasthenia variegata, sp. nov.

(Fig. 177: *figs.* 18, 19; Fig. 178: *figs.* 20, 21.)

A single incomplete individual which is so unlike any description I can find for species of this genus that it seems best to record it even though a study of better material may make a renewed description necessary. The fragment is approximately 12 mm. long and has a body width of 1.5 mm. in the widest portion at about the eighth somite. 35 somites are represented. The prostomium and the median dorsal region of the body are uncolored. On either side of the body is a dorso-lateral pigmented region, composed in each somite

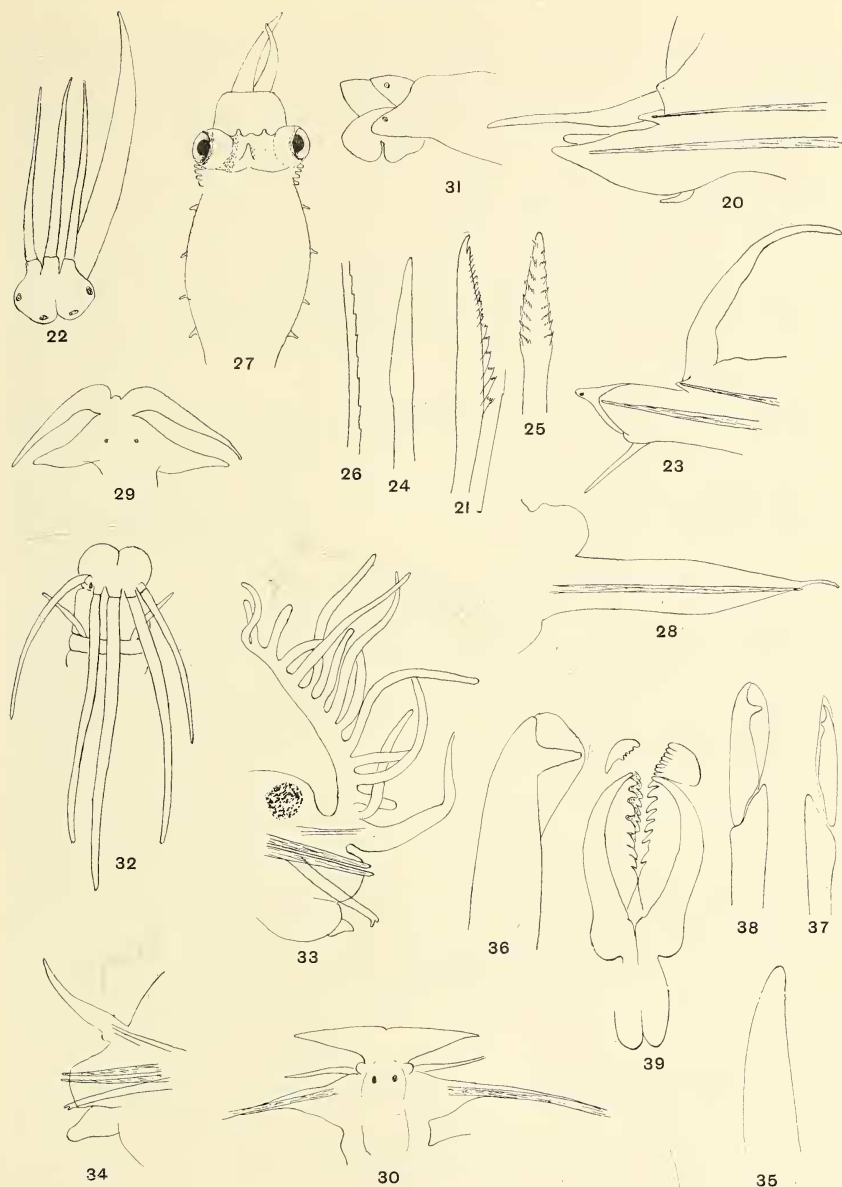


Fig. 178. 20, *Lepidasthenia variegata*, 18th parapodium $\times 27.5$; 21, seta of 18th parapodium $\times 185$; 22, *Lepidasthenia longicirrata*, anterior end $\times 10$; 23, parapodium $\times 20$; 24, notopodial seta $\times 250$; 25, 2nd form of notopodial seta $\times 250$; 26, detail of dorsalmost notopodial seta $\times 250$; 27, *Vanadis collata*, anterior end $\times 5$; 28, 49th parapodium $\times 18$; 29, *Tomopteris opaca*, anterior end $\times 5$; 30, *Tomopteris tentaculata*, anterior end $\times 27.5$; 31, parapodium $\times 27.5$; 32, *Leodice arcturi*, anterior end $\times 5$; 33, 25th parapodium $\times 27.5$; 34, posterior parapodium $\times 27.5$; 35, dorsal acicula from posterior parapodium $\times 250$; 36, ventral acicula from posterior parapodium $\times 250$; 37, seta from 25th parapodium $\times 250$; 38, seta from posterior parapodium $\times 250$; 39, mandible $\times 30$.

of three bands running transversely and close together to the base of the parapodium. In elytron-bearing somites these bands extend on to the elytophore but in the others they stop at the parapodial base. The remainder of the parapodial surfaces are without pigment. On the ventral surface there is a similarly colored pigment spot at the base of each parapodium.

Only two elytra remain and these are the last two on the left side. They overlap one another and extend beyond the median line dorsally. In life the dorsal surface of the body must have been entirely covered by the elytra. Each elytron has a smooth margin and the two that remain are nearly circular in outline. A pigment patch occupies the dorso-median portion of the elytron, covering about one third of its area and from this a narrow band of pigment extends posteriorly in the direction of the elytophore of the next elytron. This pigment is similar in color to that on the body wall. The remainder of the elytron is translucent-white and smooth.

The prostomium (fig. 18) is rather less than 1 mm. wide and 0.5 mm. long. The eyes are equal in size and prominent. All tentacles, cirri and palps are lost. The protruded pharynx extends 4 mm. in front of the prostomium. On each of its dorsal and ventral margin is a row of nine papillae, each papilla having a prominent pigment spot at about its middle. There are two pairs of teeth.

The first parapodium (fig. 19) has a slender neuropodial lobe, obliquely truncated at the apex, which carries pre- and post-setal lips. The notopodial lobe is vestigial and carries an acicula but no setae. The ventral cirrus is longer than the neuropodial lobe, and its cirrophore is colored brown. Dorsally this parapodium carries an elytophore. The eighteenth parapodium (fig. 20) has a thick conical neuropodial lobe bifid at the end and a vestigial notopodium, each lobe as before containing an acicula. The dorsal cirrus is slender and a little longer than the neuropodium while the ventral one is very small and situated near the parapodial base.

The setae of the eighteenth parapodia are all alike, expanding toward the ends and terminating in a larger apical and much smaller subapical tooth (figure 21). There are numerous rows of toothed plates proximal to these. These rows of plates are much more numerous than they are in *L. picta* (see figure 12, plate 1) and the plates are smaller. The setae of the first somite terminate in the rounded ending figured for *L. picta* (see fig. 13, plate 1) but have numerous rows of toothed plates proximal to this. It seems probable that fig. 13 is of an immature seta and that if fully developed it also would show these plates. This, however, was not apparent in the single specimen at my disposal.

Collected at 17° 39' N., 63° 17' W., in 125 fathoms.

The type is in the collections of the New York Zoological Society.

Lepidasthenia longicirrata, sp. nov.

(Fig. 178: figs. 22 to 26.)

A single specimen. All body somites are present but the only elytron represented is one of the last pair. There originally were eighteen elytra on either side. The body is 13 mm. long and 1.5 mm. wide. A noticeable feature

is the great length of the parapodial cirri, the dorsal one extending beyond the setae while the ventral one is longer than the setal lobe.

The prostomium (figure 22) is transversely oval in outline, widest at the level of the anterior pair of eyes. The prostomial width is 0.5 mm. On its anterior margin is a broad shallow incision filled by the cirrophore of the median tentacle. On the posterior border is a deeper but narrower incision. The median tentacle is broken at the end but apparently was four to five times as long as the prostomium, slender and gently tapered. Its cirrophore fills the marginal incision and overlaps on either side, partly covering the cirrophores of the lateral tentacles. The styles of the lateral tentacles are similar in form to the median but are more slender. The tentacular cirri are similar in form and size to the tentacles and to the dorsal cirri. The palp at its base is broader than half of the prostomial width, at first tapers gradually, later more abruptly, to end in an acute tip. The dorsal cirri throughout are like the one shown in figure 23 but become shorter posteriorly. There is one pair of slender anal cirri. The palps appear smooth but under a magnification of about 100 diameters they show numerous transverse rings and very small cilia. The protruded pharynx is about ten times as long as the prostomium and has the usual arrangement of terminal papillae and teeth. The teeth are light brown in color each with a darker brown axial pigment line.

The elytra which remain are nearly circular in outline and transparent, and completely cover the last three body somites.

The parapodia are essentially similar throughout the body, figure 23 being of the eighth. The neuropodium has parallel dorsal and ventral margins, but is beveled at the end. The notopodium is represented only by a minute lobe into which the acicula extends. A very few simple setae occur in the notopodium (figure 24). The neuropodial setae are of two kinds. The dorsal ones in each tuft are very slender and sharp pointed and extend beyond the parapodium to a distance equal to the parapodial length. In the parapodium figured there were ten of these. Each has a row of minute teeth along one side. A detail of this is shown in figure 26. On the ventral end of the seta tuft the setae have stouter shafts than the above variety, and a lanceolate terminal portion carrying two rows of toothed plates which in profile may look like one (figure 25). In progression dorsally from these the setae become more slender and the lanceolate portion longer until at the top they are hardly larger than those of the dorsalmost tuft. The toothed plates are always restricted to the lanceolate ends.

The type was collected at 4° 50' N., 87° W., and is in the collections of the New York Zoological Society.

From this same locality was taken three small and one larger specimens which may belong to this species. The lateral prostomial borders are more rounded than in the type and the eyes more prominent. In each half of the prostomium of the larger specimen is a dark gray patch occupying nearly one half its surface and covering its anterior eye. Another very small specimen similar to these last was collected at 2° S., 89° 30' W., in 700 fathoms. No elytra are present in any of these. A constant feature is a brown pigmentation on each elyrophore.

Family ALCIOPIDAE.

Rhynchonerella Costa.*Rhynchonerella pycnocera* Chamberlin.

Rhynchonerella pycnocera Chamberlin, 1919, pp. 147 to 150, pl. 25, figs. 7, 8; pl. 26, figs. 1 to 6.

One specimen collected at 1° 20' S., 89° 33' W., in 50 fathoms. I was unable to find the stouter setae with very delicate terminal joints figured in Chamberlin's pl. 26, fig. 6, but in other respects this agrees with his description. Fragments belonging to this species were also taken at 1° 32' S., 89° 30' W., and at 0° 17' S., 91° 34' W.

Vanadis Claperede.*Vanadis fusca-punctata* Treadwell.

Vanadis fusca-punctata Treadwell, 1906, pp. 1159, 1160, figs. 29, 30, 31.

The only differences I could find between these and the original description of this species are that the tentacles are stouter and the whole prostomium has a more swollen appearance in the *Arcturus* material. Two specimens collected at 3° 52' N., 86° 43' W., in 600 fathoms; one at 0° 0', 91° 53' W.; one at 5° 03' N., 81° 98' W., in 250 metres; one at 5° 28' N., 86° 54' W., on the surface.

Vanadis collata, sp. nov.

(Fig. 178: figs. 27, 28.)

An incomplete specimen, retaining the anterior end. This fragment is 85 mm. long and has a body width of 2.5 mm. in the region of the twenty-fifth setigerous somite. Between the first and the fifth somite is a pronounced bulging of the body both dorso-ventrally and laterally the latter much the more pronounced. I am uncertain if this is natural or if it may be due to the action of preserving fluids. The specific name has reference to the feeble development of the first ten pairs of parapodia, giving the animal the appearance of having a definite neck.

The prostomial diameter at the eyes is 2.75 mm., its length 1 mm. The anterior margin is obscured by the partly protruded pharynx and the whole head region is apparently not well preserved. Of the characteristic head appendages I was able to see only two minute elevations on the margin corresponding to the dorsal marginal tentacles and a dorsal median one lying between the eyes. Tentacular cirri are represented only by four stout protrusions on either side (figure 27).

The eyes are very large and the lenses point dorso-laterally. The cup of the eye is chestnut brown, the lens a dark reddish brown. The pharynx is partly protruded, its bifid end visible.

Aside from the eyes the only pigmentation on the specimen appears in the series of segmental glands which are present as prominent brown patches postero-dorsally to each parapodium in nearly all somites posterior to the twenty-fifth.

Apparently the anterior parapodia are badly preserved and not much can

be said about them except that they are very small. The seventh, eighth and ninth are progressively somewhat larger but the tenth is the first to assume the characteristic form. There are sixty-two setigerous somites in the body and the parapodia reach full size in the region of the thirtieth. The parapodium (figure 28 of the 49th), is uniramous, of nearly uniform diameter until near the end, when it widens and then narrows to a very acute tip, bearing a single slender cirrus at the end. The single large acicula comes to the surface just posterior to this. There is a dense tuft of slender colorless setae but I was unable to find any that are entire. Dorsal to the base of the parapodium is a rounded lobe looking like a feebly developed cirrophore, and just behind this the pigment marking the position of the glands.

One specimen, collected at 2° 0' S., 89° 30' W., in 400 fathoms. The type is in the collections of the New York Zoological Society.

Greefia McIntosh.

Greefia oahuensis McIntosh.

Greefia oahuensis McIntosh, 1885, pp. 182, 183; pi. 28, figs. 5, 6; pl. 32, fig. 11, pl. 15A, fig. 4.

The largest specimen is a mature female retaining only the first fifty somites. These measure 45 mm. in length. Collected at 2° 0' S., 89° 30' W., in 1200 fathoms. One smaller one was taken at 2° 33' S., 89° 44' W., in 300 meters; one, probably immature, at 4° 50' N., 87° W., in 300 fathoms and one fragment at 6° 10' N., 8° 11' W., on the surface.

Family TOMOPTERIDAE.

Tomopteris Eschscholtz.

An aberrant genus of annelids, generally having a transparent body (see, however, *T. opaca* below), and apparently showing a considerable degree of individual variability. The peculiar form of the prostomium with its unusually heavy tentacles, the lack of setae except in the two cirri, and the exaggerated development of the second cirrus, are distinguishing features of the genus. Two characters often relied on for species determination viz. the presence or absence of the second cirrus, and the "tail," carrying feebly developed parapodia seems, however, to be largely subject to individual variation. Apstein (1900, pp. 34, 35) states that the first cirrus is so well protected by its position that it seems unlikely that its occasional absence is due to injury, and it seems probable that the presence or absence of the tail is a matter depending on the maturity of the individual.

Tomopteris opaca, sp. nov.

(Fig. 178: fig. 29.)

While the members of this genus are characteristically transparent, this species has a heavy, opaque body, the opacity resulting from the structure of the body wall. The largest individual is 4 mm. wide and 27 mm. long. The type is 3 mm. wide and 13 mm. long.

In the largest specimen the body in both dorsal and ventral median lines

is black. Lateral to this on either side the color is as if this black tint extends to the body margin but is overlaid by a translucent yellowish material of the same color as the parapodium. In this preserved material this layer shows constrictions at the intersegmental grooves but is swollen between them, appearing almost like a series of elytra. The parapodia are colored a dense opaque yellowish white. Smaller specimens do not show the black coloration but in other respects are like the above description.

In the type the body is widest at about its median point. This is partly due to a greater width of the body proper, and partly to a greater length of the parapodia in this region. From here it tapers in either direction, the tapering being rather slight anteriorly and much greater posteriorly where it narrows to about 0.5 mm. diameter. There are twenty pairs of parapodia the posterior ones very short. There is a smooth caudal process about 1 mm. long, which appears to be entire but of this I could not be certain. A similar process is present in one other specimen but is badly macerated in the others.

The tentacles (figure 29) are stout and extend beyond the apices of the second tentacular cirrus lobes. There are no first tentacular cirri. The second tentacular cirri have stout conical basal portions, and slender terminal portions considerably longer than the body. This is not well enough preserved in any of this material to allow of accurate measurements. The parapodia are heavy, bifid at the ends and have more or less fluted terminal expansions on both branches. Owing to imperfect preservation I cannot give any further details.

The type and paratype were collected with two others at 4° 50' N., 87° W., in 550 and 700 fathoms. The type is in the collection of the New York Zoological Society, the paratype in the American Museum of Natural History.

One other species of Tomopteris has been described as opaque. Quatrefages 1865, pp. 227 to 229, pl. 20, figs. 1 and 2, states that *T. carpenteri* is maroon colored. Benham 1921, pp. 61 to 64, identified as *T. carpenteri* a species collected at Commonwealth Bay and gave a more complete description. This had the opaque body and dark dorsal and ventral areas I have described in *T. opaca*. The latter species differs from *carpenteri* in details of head structure.

Tomopteris tentaculata, sp. nov.

(Fig. 178: figs. 30, 31.)

The transparent body of the type is 6 mm. long and about 0.75 mm. wide, the total width, counting the parapodia, being 1.5 mm. The alimentary canal has relatively heavy walls and is about 0.5 mm. wide thus occupying nearly the whole body width. The tentacles are triangular in form with sharp apices, hardly extending beyond the bases of the second cirri (figure 30). The first cirri are slender, gently curved and shorter than the tentacles. The second cirri have heavy triangular bases and are about long enough to touch the fourth parapodia. The free portion of the seta is shorter than the body. There are twelve pairs of parapodia with, on the lateral body line, very slight intervals between them. The parapodium has a thick body, bifurcated at the end (figure 31) each terminal branch having the characteristic fin shaped processes. These are more or less macerated and the figure is the best drawing I could get.

The specimen was mounted in glycerine and was slightly crushed by the weight of the cover glass which somewhat modified its form. In the type, red-brown rosette organs are in the body of each first and second parapodium, and one in each apical branch of subsequent parapodia, situated near the base of the fin. The eyes are oval, red-brown in color. The brain is transverse oval with the anterior margin straight. There is no trace of a tail in either specimen. A second specimen, approximately equal in size to the type, has on the right side the same arrangement of rosette organs as the type but on the left side these do not appear in the first two parapodia and there is only one, in the body of the third parapodium. This latter specimen contained numerous eggs in cleavage stages, in its body cavity. Evidently fertilisation is internal. The type was collected at 4° 50' N., 87° W., at the surface, and is in the collections of the New York Zoological Society.

Other fragments of *Tomopteris* sp. were taken at the surface at 1° 32' S., 89° 30' W., and one at 2° S., 89° 30' W., at 1100 fathoms.

Family SYLLIDAE.

Syllis Savigny.

Syllis palifica Ehlers.

Syllis palifica Ehlers, 1901, pp. 88 to 92, pl. 10, figs. 8 to 16.

A single specimen, poorly preserved. Only one cirrus is retained and that agrees with Ehlers' description. Only the thick setae with bifid ends remain. Ehlers records that the distribution of these and of the compound ones is variable, apparently dependent on conditions of sexual maturity. Collected at 1° 22' S., 89° 39' W.

Trypanosyllis Claperede.

Trypanosyllis vittigera Ehlers.

Trypanosyllis vittigera Ehlers, 1887, pp. 151 to 154, pl. 40, figs. 1 to 3.

I have identified these specimens as *T. vittigera* from Ehlers' description, although they do not agree with his figures. The two halves of the prostomium are much more definitely distinct from one another than is indicated in his figure 1, but in this respect it seems to me his figure does not agree with his description.

There are two kinds of setae. One has a long terminal joint as shown in Ehlers' figure 3, the other has a much shorter terminal joint. In a specimen from 100D1 which was much longer than the others the marginal "cilia" of the terminal joint do not appear. These may have simply been worn off as the edge is more or less roughened.

Ehlers describes the transverse pigment bands as confined to the anterior region. This is true in small specimens but in the largest they are continued to the extreme posterior end.

Collected at Station 83.1 and at 0° 16' S., 91° 23' W., six specimens.

Trypanosyllis latifrons Grube.

Trypanosyllis (Syllis) latifrons (Grube), 1878, pp. 178, 179.

I have identified this by the character of the dorsal pigmented bands on the somites, the broad short prostomium and the arrangement of the eyes.

Two specimens collected at 17° 39' N, 63° 17' W.

Typosyllis Langerhans.

Typosyllis hyalina Grube.

Typosyllis hyalina Grube, 1863, p. 45.

The only respect in which this differs from Grube's description is that the median antenna instead of being long and articulated is rather shorter than the palps and has only two segments. This seems to be a case of regeneration.

One specimen collected at 1° 22' S., 89° 38' W.

Typosyllis corallicola Verrill.

Typosyllis corallicola Verrill, 1900, p. 603.

In all respects except color these agree with Verrill's description, though none are as large as the maximum length he gives. Verrill describes the color (in formalin), as yellowish-white with pale-greenish pigment in the annuli of the cirri. Those of this collection have the body throughout a region roughly corresponding to the extent of the pharynx, covered with minute brown spots scattered over the surface.

Numerous, collected at 1° 22' S., 89° 39' W., Hood Id.

Family NEPHTHYDIDAE.

Nephtys Cuvier.

Nephtys phyllocirra Ehlers.

Nephtys phyllocirra Ehlers, 1887, pp. 131 to 134; pl. 38, figs. 7 to 11.

Ehlers described the neuropodium in this species as having a single lip. I find that in these specimens which correspond in other respects with his description, the neuropodium has anterior and posterior conical lips extending well beyond the bases of the setae. 3 specimens collected at 38° 0' N., 74° 02' W., 1 specimen collected at 39° 15' N., 72° 0' W., in 633 fathoms.

Family CHRYSOPETALIDAE.

Chrysopetalum Ehlers.

Chrysopetalum riveti Gravier.

Chrysopetalum riveti Gravier, 1908, pp. 108 to 110, pl. 7 figs. 31, 32; pl. 8, figs. 33, 34 (in reprint).

Gravier's specimen was 18 mm. long. This one is less than 9 mm. One specimen collected at 0° 16' S., 91° 23' W., Tago Cave Galapagos.

Family PHYLLODOCIDAE.

Phyllodoce Savigny.

Phyllodoce oculata Ehlers.

Phyllodoce oculata Ehlers, 1887, p. 135, pl. 40, figs. 4, 5, 6.

One specimen collected at 17° 39' N., 63° 17' W., in 100 meters. Another

specimen from this same station, labeled as taken at 125 fathoms is very much smaller and I have recorded it as a young of this species, basing the identification on the form of the head and protruded pharynx. The dorsal cirri are white as in Ehlers' description but they do not cover the dorsal surface.

Phyllodoce varia, sp. nov.

(Fig. 179: *figs.* 69 to 71.)

A single incomplete specimen retaining approximately 100 somites. The portion remaining is 17 mm. long and has a prostomial width of 0.5 mm. The anterior 50 somites are pale yellow in color while the remainder is colorless. In the colored region the dorsal surface is marked by fine dark pigment spots which are most noticeable in the median dorsal line but also occur on either side of this, extending nearly to the somite margin. This arrangement is most obvious in the anterior somites. Farther posteriorly the pigment is arranged in a band extending across the dorso-median line of the somite, and a small spot just posterior to this in the dorsal median line. The prostomium, all cirri, and parapodia are colorless.

The prostomium (figure 69) is cordate in outline, the eyes large and brown. The tentacular cirri are slender. The protruded proboscis is about as long as the first ten body somites and has on either side six rows of rounded papillae.

In the parapodium the setal lobe is notched at the apex and the acicula extends into this notch. The dorsal cirrus is lanceolate in outline and is not very broad. The ventral cirrus is relatively broader than the dorsal and is asymmetrically lanceolate in outline. The setae have the usual compound form with a relatively short terminal joint toothed on its concave margin (figure 70). The setae at the ventral end of the tuft are much more curved than are those at the upper margin.

The type was collected at 0° 22' S., 89° 29' W., and is in the collections of the New York Zoological Society.

Phyllodoce tortugae Treadwell.

Phyllodoce tortugae Treadwell, 1917, p. 262, *pl.* 2, *figs.* 4 to 6.

One specimen, collected at 17° 39' N., 63° 17' W., in 100 metres.

Lopadorhynchus Grube.

Lopadorhynchus nans, Chamberlin.

Lopadorhynchus nans Chamberlin, 1919, *pp.* 116 to 119, *pl.* 17, *figs.* 1 to 5.

One specimen, 14 mm. long collected at 1° 32' S., 89° 30' W. One specimen 16 mm. long, marked "#79,68PT."

Lopadorhynchus uncinatus Fauvel.

Lopadorhynchus uncinatus Fauvel, 1916, *pp.* 57 to 61, *pl.* 1, *figs.* 2, 3; *pl.* 4, *figs.* 4 to 14.

Fauvel's specimens were collected in the region of the Azores and in the Mediterranean and differed from any previously described in the excessive development of the first two pairs of parapodia (as compared with succeeding

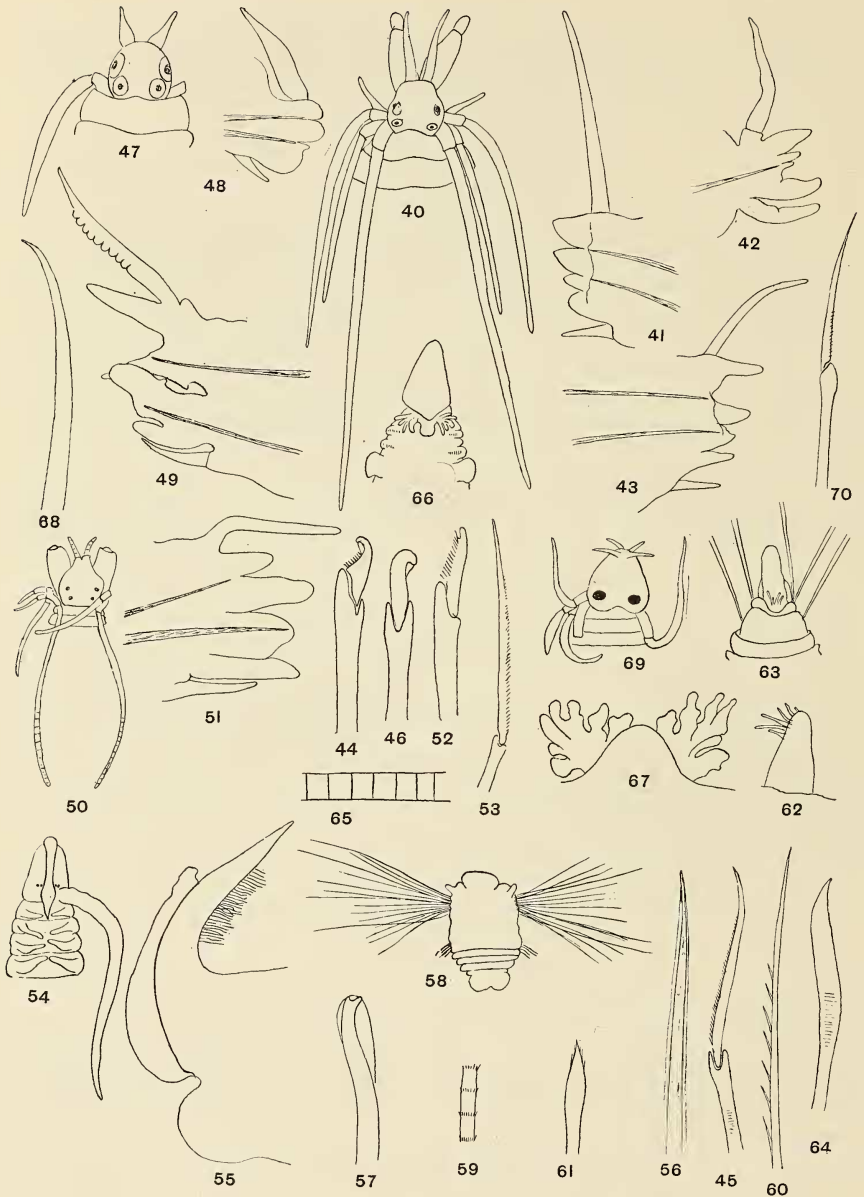


Fig. 179. 40, *Uncinereis lutea*, anterior end $\times 16$; 41, 10th parapodium $\times 45$; 42, 1st parapodium $\times 45$; 43, parapodium from middle of body $\times 45$; 44, seta from parapodium of fig. 43 $\times 250$; 45, 2nd form of setae from parapodium of fig. 43 $\times 250$; 46, compound seta $\times 250$; 47, epitokous male $\times 15$; 48, 7th parapodium of male $\times 27.5$; 49, 17th parapodium of male $\times 27.5$; 50, *Neanthes obscura*, anterior end $\times 5$; 51, parapodium $\times 45$; 52, ventral seta $\times 250$; 53, dorsal seta $\times 250$; 54, *Spio hirsuta*, anterior end $\times 20$; 55, parapodium $\times 45$; 56, anterior seta $\times 250$; 57, posterior seta $\times 250$; 58, spionid larva $\times 15$; 59, detail of seta $\times 45$; 60, end of seta $\times 185$; 61, palea $\times 250$; 62, *Semiodera glabra*, anterior end $\times 10$; 63, ventral view of anterior end $\times 10$; 64, notopodial hook $\times 68$; 65, detail of seta $\times 68$; 66, *Nuchubranchia palmata*, anterior end $\times 10$; 67, gills $\times 45$; 68, seta $\times 100$; 69, *Phyllodoce varia*, anterior end $\times 15$; 70, seta $\times 250$.

pairs). Chamberlin's *L. nans* (see above) shows this same distinction as to size but differs in that in this latter species three instead of two pairs of parapodia are thus modified. Absence of eyes is the only important distinction between the *Arcturus* specimens and Fauvel's description of *uncinatus* but as he states that the eye coloration may entirely disappear after preservation in formalin this difference is obviously of no importance. Fauvel records simple setae in the ventral part of the third parapodia. In the *Arcturus* specimens these occur also in the fourth. Two specimens collected at 0° 17' S., 91° 34' W., at 300 fathoms. One immature animal probably the young of this species was taken at 5° 03' N., 81° 08' W., in 250 metres.

Family NEREIDAE.

Nereis Cuvier.

Nereis glandulata Hoagland.

Nereis glandulata Hoagland, 1919, p. 575, pl. 30, figs. 1 to 6.

Four small and incomplete specimens were collected at 17° 39' N., 63° 17' W., in 100 meters, and one at 32° 65' N., 65° W., in 54 meters.

Leptonereis Kinberg.

Leptonereis maculata Kinberg.

Nicon maculata Kinberg, 1865, p. 178.

A considerable number of specimens of heteronereis which I have doubtfully identified as this species. They correspond to Kinberg's diagnosis as far as that goes but in common with many other taxonomists of his time, Kinberg's descriptions are too brief to allow of absolute certainty of identification. In his description there are no paragnaths on the pharynx, each jaw has seven teeth, the prostomium has an entire posterior margin, its anterior end is rounded but not narrowed, the antennae are longer than the palps and the longest tentacular cirrus extends to the seventh somite. With the exception that the antennae are about as long as the palps and the longest tentacular cirrus reaches to the eighth somite the *Arcturus* specimens correspond to this description.

All of the specimens are males, showing the characteristic modified anterior cirri. The change to the heteronereid type of parapodium comes at about the fiftieth somite. The animals vary in length from 35 to 100 mm. and in width from 1 to 3 mm. Large number, collected as 0° 27' N., 90° 19' W., (Seymour Bay, Galapagos. 1 specimen, collected at 0° 19' N., 89° 57' W., on the surface.

Kinberg (1865, p. 167) proposed the family Niconidea for nereids without paragnaths on the pharynx, and in this family he defined three genera depending on the character of the parapodia. Grube (1878, p. 62) rejected this subdivision, retaining the single genus *Leptonereis* for those nereids having no paragnaths.

Uncinereis Chamberlin.

Uncinereis lutea, sp. nov.

(Fig. 179: figs. 40 to 49.)

A small form, one cotype, a female with eggs, measuring 35 mm. in total length with a prostomial width of 0.75 mm. It has about 90 somites.

The most noticeable structural feature is the length of the postero-dorsal tentacular cirrus and of all dorsal parapodial cirri. In the preserving fluid the body often has a yellow color deepening into orange in some regions. The prostomial length is about equal to its width, being widest at the level of the anterior eyes, narrowing slightly in front of this. The eyes are very large and provided with lenses. The large size of the eyes is evidently correlated with the condition of sex development, since another specimen less than 10 mm. in length, and proportionately slender, has eyes relatively as large. The tentacles are longer than the prostomium, the palps not very stout, their rounded terminal joints extending slightly beyond the tentacles (figure 40). The postero-dorsal tentacular cirrus is stout and long, reaching to the 14th somite, the antero-dorsal is about two thirds as long as this and more slender, the postero-ventral a little shorter than the antero-dorsal, while the antero-ventral is very short, hardly reaching beyond the prostomium. All dorsal parapodial cirri are very long and slender. The female co-type retains one anal cirrus. This is very slender and is about 4 mm. long or two-thirds the length of the longest tentacular cirrus.

The tenth parapodium (figure 41) has a posterior lip which is nearly vertical, with slight protrusions where the aciculae reach the surface. There are two presetal notopodial lobes of which the dorsal is a trifle longer and more acute than the ventral. The cirrophore of the dorsal cirrus is about half way out on the dorsal lobe. There are two neuropodial lobes, the ventral being fully twice as wide as the dorsal but not quite as long. These four setal lobes are progressively shorter from above downward. The ventral cirrus is stout and extends beyond the setal lobe. The dorsal cirrus is fully four times as long as the setal lobe.

The first parapodium has only one setal lobe and acicula. Dorsal and ventral to the seta lobe are two prominent lobes. Just posterior to the apex of the acicula is a small lobe and between this and the dorsal lobe is a longer one reaching about half way to the apex of the latter. Both dorsal and ventral cirri are very prominent (figure 42).

A parapodium from near the middle of the body where the body wall is much distended with eggs (figure 43), has slender conical lobes, the space between the two notopodial ones being especially wide. The relative lengths of dorsal and ventral cirri remain about as they are farther forward.

In this last parapodium are three kinds of setae. Those of the neuropodium (figure 44) are all compound with a very short terminal joint. The apex of this is bent and is connected with the basal portion by a rod. The basal portion of this terminal joint is broad and apparently is provided with a row of slender spines along the margin although I was unable to find them in all cases. They are transparent and not easily seen and may have been broken in some of the setae. A second type of seta occurs as the dorsalmost of the neuropodial tuft and makes up nearly the entire notopodial seta bundle. In these the terminal joint is very long and sharp pointed and has a marginal row of spines (figure 45).

In all except the anterior region of the body a third type of compound seta occurs. The terminal joint is thickened and dark colored, the bent end con-

nected by a rod with the main portion (figure 46). There is thus a general resemblance to the type first described but they are much heavier and darker in color and have no marginal spines. I was unwilling to mutilate the type enough to determine exactly the distribution of these setae in it, but in a specimen of about one third the length of the type they begin on setigerous somite 16, and extend to the posterior end of the body.

Most of the specimens are immature but one mature male is described as a co-type with the female. This is in the epitokous phase. It is much smaller than the female measuring only about 13 mm. in length but has about the same number of somites. The prostomium (figure 47) is nearly circular in outline and the eyes are large. The tentacles are stouter than in the female but the palps are alike in the two sexes. Most of the tentacular cirri are lost.

The anterior parapodia have rounded lobes and the dorsal cirrus is much swollen. In the first this dorsal cirrus is hardly longer than the setal portion and is short-lanceolate in outline. In successive later somites this enlarges until in the 7th setigerous somite it has the form shown in figure 48. The setal lobes are three in number, very bluntly rounded at the ends and there is a very short, sharp pointed lobe at the end of the ventral acicula. The ventral cirrus is inconspicuous. Parapodia 8 and 9 have the blunt setal lobes but the dorsal cirri are slender though prominent. Beginning with the 10th parapodium there is an abrupt change in the form of the setal lobes which are sharp pointed. The dorsal cirri are at first simply long and slender but on setigerous somite 17 they assume a marginal lobing. The setal lobes are also modified (figure 49).

No modification of seta structure was to be found. Anterior somites have the same kinds of setae as those already described for the female. In the parapodium drawn in figure 43 there was one hook of the type shown in figure 44 and one compound seta like figure 45 with the long terminal joint. Both forms of the ordinary compound setae occur in the neuropodium.

Chamberlin (1919, p. 215, 216), proposed the generic name *Uncinereis* to include those nereids possessing stout crotchets in all parapodia except the most anterior; and having rounded anterior parapodial lobes. All specimens hitherto described were collected in the Pacific. The Arcturus specimens were collected at 26° 10' north latitude; 56° west longitude, on Sargassum.

Chamberlin does not specify the arrangement of the paragnaths except to say that they resemble those of *Platynereis*. In this genus groups I, II, V and some times VI, VII, and VIII are lacking. The paragnath arrangement is considered to be constant in the nereids, a point of much practical importance in taxonomy where the assumption of the epitokous phase may so greatly modify the appearance of the body in other respects. In none of these specimens was the pharynx protruded and because of their small size it is difficult to determine paragnath arrangement by dissection. So far as I could tell groups I and II are absent, III is in the form of long and short diagonally arranged rows, IV is absent, V is a single minute point, VI and VII are transversely arranged rows of very minute units, VIII is absent.

A second bottle from the same locality contained some very immature specimens characterized by dark parapodial glands and transverse dusting of minute specks on the peristomium.

Neanthes Kinberg.

Neanthes obscura, sp. nov.

(Fig. 179: figs. 50 to 53.)

A single entire specimen 35 mm. long and 1 mm. wide, collected at 5° 32' N., 86° 59' W.

The prostomium (figure 50), is broad at the base and very decidedly narrower between the palps. The antennae are separate at their bases and extend slightly beyond the bases of the palps. The palps have very stout basal portions and the terminal portion is a mere rounded nodule at the end of the basal. The eyes are small and in the preserved material are colored brown. Those of the same side are separated from one another by a distance equal to about twice their diameter, the anterior pair rather more widely separated. Antennae and cirri show traces of articulations.

In length the peristomium is about equal to the first somite. Apparently it is somewhat longer ventrally than dorsally but of this I am uncertain since it is distorted by the partially protruded pharynx. The paragnaths are I, 2 in a row; II, 6 to 8 in a transverse patch, the middle of the patch composed of double rows, the ends single teeth; III and IV, patches much like II with a single tooth on either side between III and IV; V, 3 conical teeth; VI, an oval patch on either side; VII and VIII, a continuous triple row, the distal row separated by a considerable distance from the other two and containing fewer teeth.

The tentacular cirri are all slender and show faint articulations toward the ends. The postero-dorsal ones are the longest, reaching to somite 8, the antero-dorsal ones not more than one third as long as these, both ventral ones very much shorter.

There is a single pair of anal cirri faintly articulated toward the ends.

A parapodium from the anterior region is shown (figure 51). The dorsal lip of the notopodium is shorter than the ventral, and a very small tuft of setae arises between the two, just dorsal to the position of the dorsal acicula. The neuropodium is rounded at the ends, the setae arising between anterior and posterior lips. The ventral lobe of the neuropodium is longer than the setae. The dorsal cirrus is slender and extends beyond the parapodium as far as the ends of the basal joint of the setae. The ventral cirrus is rather stouter than the dorsal and is shorter than the setal lobe. The ventral acicula is much heavier than the dorsal.

There are two kinds of setae. Those of the notopodial tuft and the dorsal-most of the neuropodial have slender basal joints and long slender sharp-pointed terminal ones, toothed along one edge (figure 53). The greater part of the neuropodial tuft is composed of much stouter compound setae whose terminal joint is slender as compared with the basal, its apex rounded and a row of slender spikes along one margin (figure 52). The terminal one or two of these are heavier than any of the others.

The type is in the collections of the New York Zoological Society.

Ceratonereis sp.

A fragment of the anterior end of a species of this genus was collected at 17° 39' N., 63° 17' W. The prostomium is very broad and the palps stout, though not especially long. The antennae and tentacular cirri are very slender. The jaws have 4 basal teeth with a smooth toothless portion between the terminal one of these and the apex. Group I of the paragnaths is absent; II obliquely arranged oval patches of about 14 rounded dark brown teeth; III, similar to II; IV, about 4 teeth. The basal joint of the pharynx is without paragnaths.

Family HESIONIDAE.

Hesione Savigny.*Hesione proctochona* Schmarda.

Hesione proctochona Schmarda, 1861, p. 79, pl. 28, fig. 226.

One specimen collected at 17° 39' N., 63° 17' W., at 100 meters. Two other very small specimens undoubtedly of this species had not yet acquired the coloration of the adult. These were taken at 0° 16' S, 91° 23' W.

Familt GLYCERIDAE.

Glycera Savigny.*Glycera abbranchiata* Treadwell.

Glycera abbranchiata Treadwell, 1901, pp. 200, 201, fig. 49.

Two small and much mutilated specimens. In neither is the head sufficiently well preserved to be of any use for identification. I have provisionally located them in this species because the parapodia and setae agree with the original diagnosis.

Collected at 17° 39' N., 63° 17' W., at 100 meters.

Glycera dibranchiata Ehlers.

Glycera dibranchiata Ehlers, 1864-68, pp. 670 to 702, pl. 24, figs. 1, 10 to 30, 32, 34.

Ehlers describes one specimen which had lost its posterior end as 210 mm. long and 8.5 mm. wide in the anterior region. The specimen I have is only 1.5 mm. wide. Regarding this size difference as due to immaturity of the *Arcturus* specimen I have listed this as a young individual of this species. The prostomium has only about six rings instead of the twelve or thirteen of Ehlers' diagnosis, there are compound setae in the notopodial tuft and the gills are not visible in all somites. Collected at 39° 15' N., 72° 0' W., in 633 fathoms.

Goniada Aud. et Milne Edwards.

At the same locality as the *Glycera* mentioned above was found the anterior end of a species of *Goniada*. The prostomium is evidently not ringed and there are no eyes. The dorsum of some anterior somites is marked with a dense brown color.

Family LEODICIDAE.

Leodice Savigny.*Leodice longisetis* Webster.

Eunice longisetis (Webster), 1884, p. 317, pl. 10, figs. 46 to 49.

Leodice longisetis Treadwell, 1921, pp. 27 to 30, pl. 2, figs. 5 to 8, text figs. 54 to 65.

Several specimens collected at 17° 39' N., 63° 17' W., at 100 meters and at 125 fathoms.

Leodice cariboea Grube.

Eunice cariboea (Grube), 1856, p. 57.

Leodice cariboea Treadwell, 1921, pp. 47 to 49, pl. 4, figs. 1 to 4, text figs. 136 to 143.

Several specimens collected at 17° 39' N., 63° 17' W., at 100 meters. With these is one very small specimen which has no gills and at first was taken for a species of *Nicidion*. From the jaw structure it is identified as *L. cariboea*, the absence of gills being due to immaturity. One fragment was collected at 32° N., 65° W., in 54 meters.

Leodice mutilata Webster.

Eunice mutilata (Webster), 1884, p. 315, pl. 9, figs. 36 to 40.

Leodice mutilata Treadwell, 1921, pp. 30 to 33, pl. 3, figs. 5 to 8, text figs. 66 to 76.

Several collected at 17° 39' N., 63° 17' W., in 100 meters.

Leodice culebra Treadwell.

Leodice culebra Treadwell, 1921, pp. 49 to 51, pl. 2, figs. 13 to 16, text figures 144 to 153.

One specimen collected at Saba Bank, 17° 39' N., 63° 17' W.

Leodice guanica Treadwell.

Leodice guanica Treadwell, 1921, pp. 39, 40, pl. 2, figs. 9 to 12, text figures 107 to 116.

A single incomplete specimen conforming to the description of this species in general form of body and jaw apparatus, but I was unable to find any of the bifid form of acicula. Collected at 17° 39' N., 63° 17' W.

Leodice longicirrata Webster.

Eunice longicirrata (Webster), 1884, p. 318, pl. 12, figs. 75 to 80.

Leodice longicirrata Treadwell, 1921, pp. 11 to 14, pl. 1, figs. 1 to 4, text figs. 3 to 12.

A few small specimens collected at 17° 39' N., 63° 17' W., in 100 meters.

Leodice fucata Ehlers.

Eunice fucata (Ehlers), 1887, p. 91, pl. 25, figs. 1 to 20.

Leodice fucata Treadwell, 1921, pp. 43 to 47, pl. 4, figs. 5 to 10; text figs. 127 to 135.

Three specimens collected at 17° 39' N., in 100 meters. Two are labeled

as taken at longitude 63° 16' W., and one at 63° 17' W. I am uncertain if this is an error in recording or if two hauls were made so close together.

Leodice unifrons Verrill.

Leodice unifrons Verrill, 1900, p. 644.

Leodice unifrons Treadwell, 1921, pp. 17 to 20, pl. 1, figs. 5 to 9, text figs. 21 to 30.

One sexually mature female, collected at 39° 15' N., 72° W., in 633 fathoms.

Leodice antennata Savigny.

Eunice antennata (Savigny), 1820, p. 5.

Three specimens, the largest not over 15 mm. long. They are referred to this species because of the articulated tentacles and cirri, the trifold apex of the ventral acicula and the peculiar arrangement of gills. Typically, the gill arrangement is that they begin to appear as early as the 2nd setigerous somite, and extend to the posterior end of the body, being absent from only a few of the most posterior somites. In anterior regions the gill branches are as many as 6, in the median region there are not more than 2, posterior as many as 4. The only points in which these from the Arcturus collections differ from this typical condition is that the gills are absent throughout the median region and anteriorly and posteriorly the number of branches is less than the regular number. Since these are very much smaller than the full grown animals this seems to be merely a matter of maturity. Collected at 0° 19' N., 89° 51' W.

This species was described by Fauval from Australia (1917, pp. 225 to 228, text figs. 20a, 20b) by Crossland from Zanzibar (1904, pp. 312 to 318, pl. 22, figs. 1 to 7, text figs. 56 to 60) and by Treadwell from Samoa (1922, p. 136). It seems probable that *Eunice interrupta*, described by Treadwell from Hawaii (1906, pp. 1167, 68, text figs. 45, 46) is really this species. Unfortunately the character of the ventral acicula which seems to be constant in specimens of all sizes, is not mentioned in this latter paper.

Leodice floridana Pourtales ?.

Marphysa floridana (Pourtales), 1863-69, p. 108.

Eunice floridana Ehlers, 1887, pp. 88 to 90, pl. 22, figs. 1 to 7.

A fragment of the posterior end of a leodid, which in the form of the gills, setae and anal cirri, approaches more nearly than any previously described species to this one of Pourtales, and I have tentatively listed it here.

Collected at 17° 39' N., 63° 17' W., in 100 meters.

Leodice arcturi, sp. nov.

(Fig. 178: figs. 32 to 39.)

A single complete specimen approximately 80 mm. long, its prostomial width 2 mm. Its most noticeable feature is the large size of the tentacles of which the unpaired is relatively heavy and extends to setigerous somite 12. The inner pair are about one sixth shorter than this, the outer pair two thirds the length of the inner. In a final transfer these tentacles were broken off and are now in the bottle with the type.

The prostomium (figure 32) is rounded, with only a very small median notch and no trace dorsally of a quadripartite lobing. The eyes are black. The second somite is about one-third as long as the first, the nuchal cirri extending beyond the bases of the tentacles. Succeeding somites are only a very little longer and wider than these, but there is an increase in size toward the middle of the body, narrowing at the pygidium to about one quarter of the anterior width. The specimen retains one slender anal cirrus.

The gills begin as two branches on the right side of the sixth parapodium and as four on the left side of the seventh and disappear entirely in the region of the forty-second parapodium. The number of branches increases rapidly, the tenth parapodial gill having eight branches and there are fourteen on the eighteenth.

The first parapodium has the form usual in this genus, a large dorsal and ventral cirrus, with a small setal lobe between. In later somites the dorsal cirrus remains long but becomes slender while the ventral cirrus is reduced to a small conical protuberance on the end of the rounded basal lobe of the parapodium. In the single specimen at my disposal this basal lobe is much swollen and more or less decomposed throughout the anterior region, and its structure difficult to see. Figure 33, of the twenty-fifth parapodium represents it as accurately as is possible. This parapodium carries a gill with fourteen branches some of which are broken, and a large dorsal cirrus. The setal lobe has a rounded postsetal lip, the anterior lip being shorter and vertical. There is a large pigment spot at the base of the gill.

Behind the gill region the parapodia become more nearly conical in outline and the ventral cirrus relatively more prominent. Figure 34 is of a parapodium taken from near the posterior end of the body. The slender dorsal cirrus is longer than the setal lobe and the apex of the ventral cirrus extends beyond this lobe.

Anterior parapodia have two aciculae, posterior ones have three, all noticeable on account of their large size. The dorsal ones are bluntly rounded at the end (figure 35), the ventral one hooked (figure 36). The compound setae are of the usual type, the terminal joint having apical and subapical teeth. Those from anterior somites have a more slender terminal joint than appears in posterior somites. Compare figure 37 with figure 38, the former from an anterior somite, the latter from a posterior. The simple setae are slender with scarcely a trace of lateral "fins."

The pectinate setae are few in number in each tuft. They have about ten teeth the terminal ones being longer than the others and unequal, that on one end being twice as long as that on the other.

The maxilla has in general a light brown tint, with the bases of the carrier, the inner margins of the forceps and the ends of the teeth a darker brown. There is also a dark patch where the forceps joins the carrier. The carrier (figure 39) is unusually long and narrow in proportion to its breadth, the forceps gently curved and long. The proximal paired plates have each seven teeth, the unpaired seven, the right paired eight, the unpaired three. The mandible was injured and I was unable to get an adequate description. It is slender and the thin beveled region is marked with concentric brown lines.

The type was collected at 39° 15' N., 72° W., in 633 fathoms. It is in the collections of the New York Zoological Society.

Nicidion Kinberg.

Nicidion kinbergii Webster.

Nicidion kinbergii Webster, 1884, p. 320, pl. 12, figs. 81 to 88.

Nicidion kinbergii Treadwell, 1921, pp. 91 to 93, pl. 6, figs. 5 to 8, text figs. 324 to 332.

Several, collected at 100 D. 1.

Lysidice Savigny.

Lysidice notata Ehlers, 1887, p. 100, pl. 30, figs. 1 to 9.

Lysidice notata Treadwell, 1921, pp. 86 to 88, pl. 8, figs. 1 to 4, text figs. 305 to 313.

Two specimens collected at 17° 39' N., 63° 17' W.

Lysidice sulcata Treadwell.

Lysidice sulcata Treadwell, 1901, p. 200, figs. 47, 47a, 48.

Lysidice sulcata Treadwell, 1921, pp. 89, 90, pl. 4, figs. 13 to 15, text figs. 314 to 323.

Three specimens collected at 17° 39' N., 63° 17' W., in 100 meters.

Arabella Grube.

Arabella dubia Treadwell.

Arabella dubia Treadwell, 1922, pp. 160 to 161, pl. 7, figs. 11, 12, pl. 8, figs. 8, 9, text fig. 52.

Two small specimens collected at 1° 22' S., 89° 39' W.

Oenone Savigny.

Oenone diphyllidia Schmarda (Not Ehlers).

Oenone diphyllidia Schmarda, 1861, p. 120, pl. 22, fig. 256.

Aglaurides diphyllidia (Treadwell), 1921, p. 116 to 119, pl. 7, figs. 13 to 16, text figs. 429 to 434.

Seven specimens collected at 17° 39' N., 63° 17' W.

Family ARICIIDAE.

Scoloplos Blainville.

Scoloplos grubei Gravier.

Scoloplos grubei, Gravier, 1909, pp. C114 to C116, pl. 5, figs. 49 to 55; pl. 6, figs. 60, 61 (paging of reprint).

Gravier's entire specimen was 48 mm. long. These are about 15 mm. In structure of prostomium, pharynx and setae the two agree. They differ in that acicular setae are found in twelve instead of seventeen anterior parapodia and that gills begin at about the thirteenth somite instead of the seventh. The differences seem to me to be due entirely to age, these being evidently much younger than the specimens from Peru. The locality label in the bottle reads "Hood, fd. 54."

Family SPIONIDAE.

Spio (Fabricius) Oersted.*Spio hirsuta*, sp. nov.(Fig. 179: *figs.* 54 to 57.)

The material consists of two portions of anterior regions and a fragment from a posterior region. This fragment is very much wider than either of the other pieces and I am not certain that it belongs to either of them. It is possible that this is the case since the appearance of one of the anterior fragments indicates that the body widens posteriorly. I have not, however, assumed this in the following description.

The prostomium (figure 54) is bluntly rounded, the peristomium fitting closely against the sides so that the whole head region has a conical outline. There is a gradual increase in diameter up to about the fifteenth somite, and behind this a narrowing extending to the fortieth. The region in front of somite forty has a compact, "well groomed" appearance, with its regular arrangement of parapodia and dorsal gills. Behind somite forty the appearance is more irregular. This effect is in part produced by the tufts of long white notopodial setae, which first appear at about somite forty-five and (in preserved material) stand at all sorts of angles with the body axis. Beginning in somite thirty-seven a similar tuft of white setae appears in the neuropodium. These are much shorter than the notopodial but are similarly colored and the two cooperate in making a visible distinction between the two regions of the body. The length of the first eighty somites in one specimen is 18 mm., the prostomial width is 0.5 mm.

The anterior end of the prostomium is rounded (figure 54) and the end expands so as to lie anterior to the corresponding portion of the peristomium. The prostomium narrows at the margin of the peristomium, widens again at the level of the eyes and terminates posteriorly in a point which extends over the dorsal surface of the first setigerous somite. Two eyes on either side are arranged in a transverse row. The peristomium seen from above gives the impression of a flattened plate whose margins are folded up to join the lateral margins of the prostomium. In each of the two specimens only one tentacle remains. This is heavy at the base but narrow at the apex and extends as far as the twelfth setigerous somite. In preserved material it is much coiled. In order to show its length it is drawn in figure 54, as it appears when straightened. On a ventral view the knob-like end of the prostomium terminates the head region, the peristomium fitting closely behind this and is no wider than it. The outline of the prostomium is that of a broad cone. A continuation of the median ventral band of the body extends to its end, and a fine white line on either side (nerve commissure?) runs from the mid-ventral line in an antero-lateral direction around the peristomium.

The setal portion of the anterior parapodia (figure 55 of the fifteenth) extends but little from the general body surface but post-setal vertical lobes are very prominent. In the neuropodium these are evenly rounded in outline and not quite a half circle in area. In the notopodium the ventrally directed margin

of these lobes is quite similar in form to the dorsal margin of the ventral lobe from which it is separated by a narrow interval, while dorsally the lobe is continued as a narrow marginal "fin" on the outer edge of the gill extending two-thirds of the length of the latter. The gill is broad at the base but soon narrows to about one-half the basal width and is continued of uniform width until near the end when it shades off into an acute point. Its concave inner margin from the surface of the body to the point near the end where it narrows, is covered with a dense mass of fine hair-like processes equal in length to about one-half the diameter of the gill (figure 55). The gill extends dorsally as far as the mid line of the body. Since when seen from above the outlines of the gills are triangular, narrowing decidedly from base to apex, they leave uncovered a large part of the dorsal body surface. The gill is apparently the modified dorsal cirrus. I could find no trace of a ventral cirrus or of aciculae.

The anterior setae are rather stout, bilimbate and very sharp pointed, arranged in each tuft in a vertical row. Each (figure 56), is straight, sharp pointed and bilimbate. Beginning in one specimen on the twenty-eighth setigerous somite, and extending as far as the end of the fragment the neuro- and nopodium each has a tuft of hooded setae (figure 57). These are present in the anterior portion but absent from the posterior portion, of the fragment of a posterior end. Apparently they occur only in the median body region.

Collected at 5° 32' N., 86° 59' W. The type is in the collection of the New York Zoological Society.

Spionid larva, Gen. ? sp. ?

(Fig. 179: *figs.* 58 to 61.)

Surface collecting at 0° 05' South latitude; 91° 11' West longitude, yielded a single larva, evidently of a spionid. It is about 1 mm. long (figure 58), the body rather stout. Posteriorly there is a clear indication of three somites beside the pygidium, but the preservation is too poor to make it possible to determine the details with any accuracy. Anteriorly on either side is a short stumpy cirrus, and postero-ventral to this a tuft of 20 or more setae. Basally the shaft of each of these is banded at regular intervals with a row of short spines giving the shaft an articulated appearance (figure 59). Toward the end these spines are replaced by a double row of larger spiny plates. (Lateral view shown in figure 60.) These setae vary greatly in length, the longest exceeding the transverse body diameter. On either side, toward the posterior end, is a small tuft of a few flattened paleae (figure 61). The one drawn was slightly frayed at the end. This was probably accidental.

Family FLABELLIGERIDAE.

Semiodera Chamberlin.

Semiodera glabra, sp. nov.

(Fig 179: *figs.* 62 to 65.)

The type which is more than twice as long as any other in the collection, is 30 mm. long. At the prostomium it is barely 1.5 mm. wide but enlarges to a

width of 4 mm. in the region of the fifteenth somite, from which it again narrows to a width of about 2 mm. at setigerous somite twenty-seven. This latter width is continued practically unchanged for about twenty somites more, the anal somite being slightly narrower. Other specimens have essentially this form, but are somewhat narrower.

The surface of the body has a gray color due to a deposit of a translucent secretion which is more or less incrustated with fine sand grains. Underneath this the body surface under low magnification appears smooth, but if examined with a magnification of seventy to one hundred diameters numerous fine "cilia" are seen covering the entire surface.

In most specimens the prostomial region is retracted and nothing of interest can be said concerning it. In the type a formless mass protrudes from the mouth and dorsal to this is a rounded lobe longer than the prostomium, and with rounded ends. This carries a few short cirri on its margin (figure 62). In others the margin has a row of longer cirri. This is quite similar in appearance to fig. 7, pl. 42 of *Siphonostomum cariboeum* Grube, given in Ehlers (1887). Figure 63 is drawn from the anterior ventral surface of a specimen much smaller than the type, and shows the form of the gill-bearing lobe and its relation to the mouth. At the base are a few cirrus-like tentacles but these are only partially protruded and their relations are not clear. The figure also shows a ventral view of the first three somites. These narrow toward the prostomium but retain their circular outline in cross section, never becoming flattened on any surface. No specimen showed the palp (or tentacle) structure.

The first three sets of dorsal setae are elongated and extend in front of the prostomium forming the characteristic "cage." The ventral setae of the first two somites cooperate in forming this cage, while the third neuropodial ones are shorter and evidently do not. Beginning with the fourth setigerous somite and continuing posteriorly the notopodial setae retain their capillary character while those of the neuropodium are hooked (figure 64). Behind the third seta tuft the notopodial setae decrease in size, the length remaining constant throughout the greater part of the body. They are sharp pointed at the apices and the stalks have the articulated structure characteristic of this family. This is a true articulation and not merely a surface marking since the plane of division is visible at all focal points when examined under high power objective (figure 65). 18 specimens collected at 1° 22' S., 89° 39' W., in 15 ft. Apparently the type specimen is the only adult the others all being very much smaller.

The genera of this family are much confused. Chamberlin 1919, p. 397, proposed the new generic name *Semiopera* with *Siphonostomum cariboeum* Grube as the genotype. *S. glabra* seems closely related to this genotype but differs from it in the relatively slight development of the dermal papillae.

Stylarioides sp.?

In the same bottle with *Semiopera glabra* were a number of other specimens of this same family, the largest not more than 15 mm. long. The body tapers very slightly toward the anterior end, which is obliquely truncated so that it bears a dorso-anteriorly directed flat rounded plate. About midway of its

length the body abruptly narrows to less than half its anterior width and is continued in this diameter to the posterior end. There is a very fine incrustation over most of the body with a denser one, carrying a larger amount of sand, over the cephalic plate. A single tuft of long setae extending to a long distance beyond the prostomium, arises on either side of the ventral end of the cephalic plate.

Beginning with somite 2, slender notopodial and hooked neuropodial setae occur in each somite. The hooked setae are like those of *Semiodera glabra*. In one specimen a lobe, occupying a position like the tentacular lobe of *S. glabra* was protruded from the mouth, but there were no tentacles.

From the small size of these animals I infer that they are very immature specimens and since the gills, an important feature of the taxonomy, are not present, it seems unwise to do more than record the above details.

Family MALDANIDAE ·

Maldanids, Gen. and sp.?

In a bottle marked 53D2 are tubes and portions of anterior ends of a number of maldanids, but because of poor preservation of the anterior ends and entire absence of the posterior regions I am unable to determine with certainty even the genera.

Family SABELLARIIDAE.

Idanthyrsus Kinberg.

Idanthyrsus cretus Chamberlin.

Idanthyrsus cretus Chamberlin, 1919, pp. 485 to 487, pl. 75, figs. 8 to 15.

Two specimens one of which is 12 mm. long and lacks the greater part of the abdominal region. In the following particulars, none of which are of specific importance, it differs from Chamberlin's description. There are two dorsal hooks on the right side, the branches of the pinnate paleae are equal instead of unequal and the dorsal thoracic paleae seem symmetrical at the ends though on account of imperfect preservation I could not be certain on this point. I did not find any stout tapering setae in the thoracic notopodia, but did find in both neuro- and notopodia very slender pinnate setae in general form like the marginal opercular setae but extremely slender.

Collected at Tagos Cove, Galpagos, at 1° 16' S., 91° 23' W.

Family OPHELIIDAE.

Nuchubbranchia, gen. nov.

The body is fusiform, like *Ammotrypane* in general outline, without eyes or ventral furrow. Anal somite simple, margins of terminal orifice faintly scalloped. One pair of gills, dorsal to torus on the first somite.

Genotype *Nuchubbranchia palmata*. In collections of the New York Zoological Society.

Nuchubbranchia palmata, gen. et sp. nov.

(Fig 179: figs. 66 to 68.)

The type is 23 mm. long, 3 mm. at widest point and has twenty-one pairs of parapodia. The body is widest at the middle, tapering in both directions from there, the anal somite being wider than the prostomium.

The prostomium is bluntly conical in outline, about 1 mm. wide in its greatest diameter. The base is slightly narrowed and in the type the posterodorsal margin has the form of a blunt point (figure 66). This seems to have been due to the preservation, since it does not show in other specimens. Attached to the posterior margin of the prostomium is a rounded flap protruding posteriorly over the dorsal surface of the first somite. Immediately behind this is on either side, a flat plate with indented margins. This I at first thought was a protruded nuchal organ but it is located on the first somite and is evidently a gill. Figure 67 shows the appearance of the two gills and the flap as seen from in front after removal of the prostomium. Ventral to each gill is a vertical row of setae carried in a very slight swelling. Setigerous somite 2 has a similar torus with its vertical row of setae. In setigerous somite 3 the parapodium is distinctly divided into a dorsal and a ventral rounded elevation the setae arising from a short conical lobe lying half way between the two. Most of the setae are broken. Entire ones are curved and sharp pointed at the end with smooth margins (figure 68).

Collected at 0° 10' N., 88° 22' W., in 400 fathoms, 2 specimens; 0° 17' S., 91° 34' W., 20 specimens; 4° 50' N., 87° W., in 500 fathoms, 1 specimen; 4° 52' N., 84° 42' W., in 600 fathoms, 2 specimens. Sta. 282, 3 specimens; the type at 0° 00' Lat., 91° 53' W. and is in the collection of the New York Zoological Society.

Family TEREBELLIDAE.

Terebella Linnaeus.

Terebella brunneo-comata Ehlers.

Terebella brunneo-comata Ehlers, 1887, pp. 237 to 241, pl. 51, figs. 1 to 5.

One specimen collected at 17° 39' N., 63° 17' W., in 100 meters.

Loimia Malmgren.

Loimia bermudensis Verrill.

Loimia bermudensis Verrill, 1900, pp. 595 to 670, pl. 70.

Verrill speaks of this as rather a stout species. I have listed with some hesitation, as this species, one collected at 17° 39' N., 63° 17' W., in 100 meters, though the specimen is rather slender. The structure of the mouth parts and the gills conforms to Verrill's description.

Family SABELLIDAE.

Sabella Linnaeus.

Sabella melanostigma Schmarda.

Sabella melanostigma Schmarda, 1861, p. 36, pl. 32, fig. 190.

A single specimen whose gills had been lost; in a mud tube. Collected at 17° 39' N., 63° 17' W.

Family SERPULIDAE.

Pomatostegus Schmarda.*Pomatostegus stellatus* Abildgaard.*Terebella stellata* (Abildgaard), 1789, p. 142.

One specimen collected at 17° 39' N., 63° 16' W., in 130 meters.

BIBLIOGRAPHY.

AFSTEIN, C.

1900. Die Alciopiden und Tomopteriden der Plankton Expedition. Ergebnisse Plankton Expedition, Bd. 2, Hb, pp. 62, pls. 14.

AUDOUIN, J. V. ET MILNE EDWARDS, A.

1834. Recherches pour servir a l'histoire naturelle du littoral de la France. Paris. 2 vols. Vol. 2, pp. 1-290, pls. 1-8.

AUGENER, H.

1910. Bemerkungen über einiges Polychaeten von Roscoff, über zwei neue Polynoiden des Berliner Museums und über die Brutpflege von *Hipponoe gaudichaudi*, Aud. et M. Edwards. Zoologischer Anzeiger Bd. 36, pp. 241-249, 7 figs. (Specific name misspelled *gandichaudi*).

BAIRD, W.

1865. Contributions toward a Monograph of the species of Annelids belonging to the Aphroditacea. Jour. Proc. of the Linnean Soc. of London. (Zoology.) Vol. 8, pp. 172-202.

BENHAM, W. B.

1921. Scientific Reports, Australian Antarctic Exp. 1911-1914. Series C, Zoology and Botany. Polychaeta, pp. 1-128, 6 plates and a map.

CHAMBERLIN, R. V.

1919. The Annelida Polychaeta. Mem. Mus. Comp. Zool., Harvard College, 48, pp. 1-514, pls. 1-80. Cambridge, Mass.

CROSSLAND, C.

1904. The Marine Fauna of Zanzibar and British East Africa. Polychaeta Pt. 3. Proc. Zool. Soc. London, Vol. 1, pp. 287-320, pls. 20-22, text figs. 43-66.

EHLERS, E.

- 1864-68. Die Borstenwürmer. (Annelida Chaetopoda) nach systematischen und anatomischen Untersuchungen. Leipzig.
1887. Florida Anneliden. Reports on the Results of Dredging under the direction of L. F. Pourtales during the years 1868-70, and in the Caribbean Sea (1878-79) in the U. S. Coast Survey steamer Blake. Mem. Mus. Comp. Zool. Harvard College, Vol. 15, pp. vi and 1-328, Pls. 1-60.
1901. Die Polychaeten des Magellanischen und Chilenischen Strand. Festschrift 150jähr Besteh. Ges. Wiss. Göttingen. pp. 1-232, pls. 1-25, Göttingen.

FAUVEL, PIERRE.

1916. Resultats des Campagnes Scientifique accomplies sur son yacht par Albert 1er, Prince Souverain de Monaco. Fasc. 48, pp. 1-152, pls. 1-8.
1917. Annélides Polychètes de l'Australie meridionale. Archiv. de Zoologie Experimentale et Generale. Tome 56, fasc. 3, pp. 159-277, pls. 4-8.

GRAVIER, CHAS.

1908. Sur les Annélides polychètes rapportés par M. le Dr Rivet, de Payta. (Perou.) Bull. du Mus. d'Hist. naturelle. Tome 13, pp. 525-530, and 14, pp. 40-44.
(My copy, a reprint, is paged C93-C125, pls. 1-6. Place of publication not given.)

GRUBE, ADOLPH-EDWARD.

1855. Beschreibung neuer oder wenig bekannter Anneliden. Archiv. f. Naturgesch. 21.
1856. Annulata Oerstediana. Vidensk. Meddel. fra d. Naturh. Foren. Kjobenh. pp. 44-62.
1863. Beschreibung neuer oder wenig bekanntner Anneliden. Archiv. f. Naturgesch. 29.
1878. Annulata Semperiana. Beiträge zur Kenntniss der Annelidenfauna der Phillipinen. Mem. St. Petersburg Acad. Impériale des Sciences. Ser. 7, tome 25, No. 8, pp. i-ix, and 1-300, 15 pls.

HOAGLAND, RUTH.

1919. Polychaetous Annelids from Porto Rico, the Florida Keys and Bermuda. Bull. Am. Mus. Nat. Hist. 41, pp. 571-591, pls. 29-32.

KINBERG, J. G. H.

1857. Anim. Annulata, Ofvers. K. Vetensk. Akad. Forh. pp. 11-14.
1865. Annulata nova. Ofvers K. Vetensk. Akad. Forh. pp. 167-179.

MCINTOSH, WM. C.

1885. Report on the Annelida Polychaeta collected by H. M. S. Challenger during the years 1873-76. Report on the Scientific Results of the Voyage of H. M. S. Challenger, Vol. 12, pp. i-ii and 1-554, pls. 1-55, 1A-39A, 1 map, 91 text figs.

PALLAS, P. S.

1766. *Miscellanea zoologica, quibus novae imprimis atque obscurae animalium species describuntur et observationibus iconibus qui illustrantur.* (Hagae Comitum, Van Cleef) 224 pps. 14 pls.

POURTALES, L. F. DE.

- 1863-69. Contributions to the fauna of the Gulf Stream at great depths. *Bull. Mus. Comp. Zool. Harvard College*, Vol. 1, pp. 103-120.

QUATREFAGES, A. DE.

1865. *Histoire naturelles des Annelés, marins, et d'eau douce.* Paris. Tome 1, pp. i-vii, 1-588, T2 pp. 1-794, pls. 1-20.

SAVIGNY, J. C.

1820. *Système des Annélides principalement des celles de côtes de l'Egypte et de la Syrie.* Paris, pp. 128.

SCHMARDA, L. K.

1861. *Neue wirbellose Thiere, beobachtet und gesammelt auf einer Reise um der Erde 1853-1857.* Band 1, Hft. 2, pp. 1-164, pls. 16-36.

TREADWELL, A. L.

1901. *The Polychaetous Annelids of Porto Rico.* *Bull. U. S. F. Commission for 1900.* Vol. 2, pp. 183-210, 81 text figs.

1906. *Polychaetous Annelids of the Hawaiian Islands collected by the Steamer Albatross in 1902.* *Bull. U. S. F. Commission for 1903,* Pt. 3, pp. 1145-1181, 81 text figs.

1911. *Polychaetous Annelids from the Dry Tortugas, Florida.* *Bull. American Museum Nat. History, N. Y. City*, Vol. 30, Art. 1, pp. 1-12, 29 text figs.

1917. *Polychaetous Annelids from Florida, Porto Rico, Bermuda and the Bahamas.* Publication No. 251, *Carnegie Inst. of Washington*, pp. 255-268, 3 plates.

1921. *Leodicidae of the West Indian Region.* Publication No. 293 of the *Carnegie Inst. of Washington.* Pp. 129, pls. 1-9, 467 text figs.

1922. *Leodicidae from Fiji and Samoa.* Publication No. 312 of the *Carnegie Inst. of Washington.* Pp. 127-170; pls. 1-8 and 69 text figs.

VERRILL, A. E.

1900. *Additions to the Turbellaria, Nemertea and Annelida of the Bermudas.* *Trans. Conn. Acad. Sciences*, Vol. 10, pt. 2, pp. 595-670. 1 plate.

WEBSTER, H. E.

1884. *Contributions to the Natural History of Bermuda.* *Bull. U. S. Nat. Museum*, No. 25, pp. 307-327, pls. 7-11.